The Benefits and Disadvantages of e-Learning During Covid-19

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Abstract: The theme of the research is topical, there are changes in the e-learning during Covid-19 which changes set new tasks in the study process at the universities, as well as new communication links and the changes of the culture of pedagogical technologies. The aim of the research is to define the benefits and disadvantages of the e-learning in the study process at the universities and their correspondence with the needs of the students and academic staff during Covid-19. There are the following tasks to achieve the aim: to specify the functions of the meaning of the e-learning based on the changes in the e-environment during Covid-19; to investigate the adequacy of the contents of the university studies with the demand of e-learning nowadays; to find out the pedagogical instruments in the cognitive process which functions as a pedagogical form of the professional development and manifests itself in the benefits and disadvantages to the university education in the e-environment. In order to define the benefits and disadvantages of e-learning of the university education the authors take into account the theories of the science of pedagogy and education management. The following methods are used in the paper: abstract analysis, content analysis, systems analysis, interviews, surveys, questionnaires, economic experiment. The base of the research is the Universities of Latvia. The research is done in the period of 2019-2022.

Keywords: e-learning, Covid-19, e-environment, university, academic staff, students

1. Introduction

This is the first research on the analysis of factors influencing university studies in the e-learning and e-environment integration process by making use of Covid-19 factors, benefits and disadvantages of the e-learning development have been revealed.

Academic years 2018/2019 - 2021/2022 has been a challenge for representatives of many professions, including lecturers, and the challenges keep influencing the professional activities of lecturers and cooperation with students. In social networks, negative conclusions about the harm of restrictions on the activities and well-being of lecturers prevail. However, the daily issue is and remains as follows: how to replace the regular classes with a different type of lesson structure? This shift is dictated by restrictions introduced in Latvia; moreover, lecturers must react immediately, without methodical support and recommendations. In a crisis situation, educators are forced to use various forms of study organization as alternatives. The main problem is the principle of substitution and its connection with the goal of professional activity pursued by lecturers.

Can a lecturer achieve the goal and tasks set by himself or herself and provided for in the study programme using changing components of the study process? How do the changing circumstances and environment affect students and their choice to attend classes?

2. Background

2.1 Learning and teaching

In the Latvian national research programme CovidLife, 349 lectures of Latvian higher education establishments (HEE) and colleges were surveyed. The main conclusion was: “In Covid-19, the need is the best teacher” (Valsts pētījumu programma CoviDzīve, 2021). We fully agree with the lecturers’ opinion that a lecturer working in higher education must learn continuously, and at this stage of remote studies they have increased their skills at a turbo pace. However, in the near and distant future, care must be taken to ensure that pedagogical goals and student learning are a firm No 1 in the study process, because technologies become effective only when the lecturer knows how to use them well and is able to evaluate where they are not needed.

However, it should not be forgotten that the process is mutual – there is learning and teaching. “Teaching” is more often referred to the competence of the lecturer to organize, manage, and evaluate the study process. In

turn, "learning" refers to a practical activity carried out by students for the acquisition of knowledge, skills, and attitudes, which is particularly painful during this crisis. Therefore, higher education institutions should therefore be able to organise full-time and part-time studies, provide flexible forms of study, combined learning, and distance learning to respond to the needs of different groups of students, which, from a pedagogical point of view, strengthens combined learning (European Higher Education Area, 2020).

This can be achieved by creating a supportive environment, both in terms of funding and regulation, that enables higher education institutions to tailor education provision to the needs of different types of learners (lifelong learners, part-time learners, learners from underrepresented and disadvantaged groups), and to build a culture of equity and inclusion.

It is essential to promote continuous professional development (cross-border) and exchange of good practices among lecturers as well as to explore ways to promote new and innovative study methods, with a particular focus on inter-and multidisciplinary approaches, a research-based "teaching and learning" process.

2.2 Comparative analysis of videoconferencing software for online studies

Coronavirus has contributed significantly to the demand for videoconferencing software designed for remote studies and work. For example, since December 2019, the number of users of videoconferencing apps *Zoom* has increased 20 times. Thus, at the moment, in many countries *Zoom* is the market leader in the field of videoconferencing software for remote studies and work. One of the competitors, *Google Meet*, boasts a 30-time increase in the number of the software downloads in the US. According to the data provided by the service App Annie, during the same period, downloads of the *Microsoft Teams* app (with video call support) increased 11 times in the United States market, 30 times in Italy, and 15 times in Spain (currenttime.tv, 2022)

Since *Zoom* and *Microsoft Teams* stand out among the most popular software for organization of remote learning and work, we were curious to compare these direct competitors and identify the advantages and disadvantages of each of them.

For greater objectivity, it is worthwhile to define certain criteria and verify them for each of the software. It would be important to dwell on the system requirements, the supporting functions in the use of various equipment, the existing operating restrictions, the comfort of use, stability, connection quality, and software functionality (ms-teams.ru, 2022).

- System requirements: According to the official information, the system requirements of *Zoom* are slightly lower relative to *Microsoft Teams.* Namely, the *Zoom* software can work on a computer with a single-core processor with a frequency of 1 GHz against a dual-core processor with a frequency of 1.6 GHz in *Microsoft Teams*; *Zoom* does not have minimum screen resolution requirements; *Zoom* takes up slightly less disk space (ms-teams.ru, 2022; explore.zoom.us, 2022).
- Availability: Everything is quite simple here: both software support Windows, Mac OS and Linux operating systems as well as Android and iOS mobile platforms. The latest versions of the apps can be downloaded for free from the official website while the app for smartphones and tablets can be downloaded from the Google Play Store and the App Store (microsoft.com, 2022; zoom.us, 2022).
- Free version restrictions: In this aspect, *Microsoft Teams* has an advantage. Namely, a free *Zoom* account has a 40-minutes limit on the maximum duration of the video conference, and then the session ends (versus.com, 2022). This is a very significant fact because *Microsoft Teams* has no such restrictions.
- Ease of use: Installing and configuring both apps is equally simple but the registration process in *Microsoft Teams* is somewhat more complicated. It can even scare off new users, which is clearly a drawback. All the other features and buttons are easy to find, so it is quite difficult to get confused, for example, with the launch of your conference on both apps. However, the advantage in this category should go to the *Zoom* app.
- *Stability:* The *Zoom* app was first presented to the public in 2013 (zoom.us, 2022). Over these years, the developers have done a great job eliminating most of the errors and making its use as comfortable as possible. Deviations still occur, but not so often. The *Microsoft Teams* software was released in 2016 (microsoft.com, 2022), and even an outstanding developer could not avoid the unforeseen errors that users

often observe. This is especially true for the type of account login, switching between login accounts, registration, etc. In terms of stability, the *Zoom* app is definitely the best.

- Video and sound quality: Both *Zoom* and *Microsoft Teams* apps are not too demanding on the web speed and demonstrate good video and sound quality even at a slow web speed (adjusts automatically). It can be affected only by the stability on the user's part. According to these indicators, it is difficult to give preference to any of the programs, but there is one important nuance. In *Zoom* settings, the HD video (720p resolution) is disabled by default but it can be turned on manually. Meanwhile, in the *Microsoft Teams* app it is impossible. In addition, the *Zoom* app has an option to switch to FHD (1080p resolution) where an expensive paid web plan is used.
- Availability of useful functions: In this aspect, both software are almost identical. Both *Zoom* and *Microsoft Teams* offer: (a) good-quality online conferencing with video capability; (b) screen sharing, including with sound, for example to show presentations, videos, or other materials; (c) background change for participants; (d) recording conference progress so that a video file can be watched later; (e) creating a convenient structure (hierarchy) for employees.

So, based on the results of direct comparison of *Zoom* and *Microsoft Teams,* we have come to a conclusion that *Zoom* looks a little better due to lower system requirements, stability, and ease of use. The main disadvantage of the *Zoom* program is the limitation of the conference duration for a free account (40 minutes).

In turn, the *Cisco Webex Meetings* is a webinar and conference software developed by *Cisco* for its own purposes and offered to other companies. The software also has a free version that can be used to hold small remote events (webex.com, 2022; habr.com, 2022).

3. Methodology

Each of the experts was asked to describe his or her work experience as a lecturer at the HEE in general and during Covid-19 (a/y 2018/2019–2021/2022) according to seven criteria: (1) scientific degree and academic position in higher education institution; (2) work experience as a lecturer in higher education institution; (3) bachelor's courses delivered by the expert; (4) master's courses delivered by the expert; (5) doctoral courses delivered by the expert; (6) supervision of term papers, internship papers and final thesis; (7) participation in the work of term paper, internship paper and final thesis defence committees. The above characteristics of experts is summarized in Table 1. It follows that all experts are competent enough to qualify as such. Therefore, experts can participate in the study on the advantages and disadvantages of e-study in higher education institutions in Latvia during Covid-19.

Summary of the expert information about the software used in the e-study environment and technical support of the HEE shows that the first expert works with *Zoom*, the second expert – with *MS Teams*, and the third expert – with *Cisco Webex*. Technical support provided to all experts was similar. Namely, it was an electronically prepared instruction for work with the selected software, available on the website of the HEE, in the section available to academic staff and students. Lecturers could access all technical consultations only remotely, as face-to-face meetings were prohibited during Covid-19. This caused some stress first, because during the classes lecturers were forced to focus more on the technical nuances and less on the content of the lessons.

From 9 to 23 May 2022, a survey of experts was conducted. Three experts with long-term academic experience in various HEE of Latvia and a doctoral degree in economics participated in the survey. The survey covered the remote work of lecturers of social science study programs during Covid-19. The main focus was on the lecturer's work in the study programs of economics, management, tourism, and education management. The experts were interviewed electronically via e-mail. Therefore, each expert could express his or her opinion without affecting

For this purpose, we improved a survey form that was designed by our second author Sarmite Jegere and approbated already before. It includes three tables with six statements. Statements in table 2 concern bachelor's studies, statements in table 3 regard master's studies, and statements in table 4 refer to doctoral studies. Each table contains the same six statements.

In addition, each of the experts was asked to name in the order of priority three advantages and three disadvantages of the e-study environment during Covid-19 at the HEE he or she works for and briefly comment on the advantages and disadvantages.

Table 1: The characteristics of experts and his or her work experience as a lecturer at the HEE during Covid-19

No	Criteria for expert evaluation	Expert No 1 (E1)	Expert No 2 (E2)	Expert No 3 (E3)
1	Scientific degree and academic position at the higher education establishment in 2022	Dr.oec., Professor	Dr.oec., Professor	Dr.oec., Associate Professor
2	Work experience as a lecturer at the higher education establishment till 2022	26 years	32 years	16 years
3	Bachelor's courses delivered by the lecturer in period 2018-2022 per academic year (average)	2 study courses (12 ECTS)	7 study courses (22,5 ECTS)	5 study courses (30 ECTS)
4	Master's courses delivered by the lecturer in period 2018-2022 per academic year (average)	1 study course (3 ECTS)	2 study courses (6 ECTS)	1 study course (4,5 ECTS)
5	Doctoral courses delivered by the lecturer in period 2018-2022 per academic year (average)	3 study corses (24 ECTS)	None	None
6	Supervision of term papers, intership papers and final thesis in period 2018 -2022 per academic year (average)	5 intership papers, 8 final thesis	2 intership papers, 3 final thesis	100 term papers, 100 intership papers, 55 final thesis
7	Participation in the work of term papers, intership papers and final thesis defence commitees in period 2018-2022 per academic year (average)	1 final thesis defence commitee	None	2 term papers, 2 intership papers, 6 final thesis defence commitees

4. Results

According to the results of the expert survey summarised in table 2, in the remotely implemented bachelor's courses, one expert partially agrees with statements B1 and B4 and two experts agree with both statements. Thus, it leads to a conclusion that lecturers can deliver bachelor's lectures, seminars, and workshops remotely with 90 %–100 % return, but in some cases with near 90 % return. In contrast, two experts agree partially and one expert agrees with statements B3, B5, and B6. It follows that students technically connect to remote bachelor's lectures, seminars, and workshops. However, periodically or regularly, some of the bachelor's students do not engage in communication with the lecturer during the lesson. In addition, it can be concluded that in remote workshops the lecturer can only partially or cannot fully implement an individual approach to each bachelor's student. When comparing expert ratings on statement B2, each expert has his or her own different rating. This means that each lecturer has different technical provision of the Internet.

According to the results presented in expert survey table 3, all experts agree with statement M1 and statement M4 in relation to the remotely delivered master's courses. It brings to conclusion that lecturers can deliver master's lectures, seminars, and workshops remotely with 90 %–100 % return. In contrast, two experts agree partially, and one expert agrees with statements M3 and M5. It follows that students technically connect to remote master's lectures, seminars, and workshops. However, periodically some of the master's students do not engage in communication with the lecturer during the lesson. Nevertheless, one expert admits that all master's students engage in communication with the lecturer during the lesson. Whereas two experts agree partially, and one expert agrees with statement M6. Thus, it can be concluded that in remote workshops the lecturer can only partially or cannot fully implement an individual approach to each master's student. When comparing expert ratings on statement M2, each expert has his or her own different rating. This means that each lecturer has different technical provision of the Internet.

Table 2: The results of the expert's survey about bachelor's online classes during Covid-19

No	Statements about bachelors' online classes	Disagree	Partially agree	Agree
B1	I can deliver lectures online with 90 %–100 % return		E2	E1; E3
B2	Web coverage problems prevent me from a successful delivery of online lectures	E3	E1	E2
B3	When delivering lectures online I observe that students connect but do not actually participate (engage themselves in side issues)		E1; E3	E2
B4	I can deliver seminars and workshops with 90 %–100 % return		E2	E1; E3
B5	I fail to involve the whole group in seminars and workshops		E1; E3	E2
B6	In workshops, an individual approach to each student is limited		E1; E3	E2

Table 3: The results of the expert's survey about master's online classes during Covid-19

No	Statements about masters' online classes	Disagree	Partially agree	Agree
M1	I can deliver lectures online with 90 %–100 % return			E1; E2; E3
M2	Web coverage problems prevent me from a successful delivery of online lectures	E3	E1	E2
M3	When delivering lectures online I observe that students connect but do not actually participate (engage themselves in side issues)	E3	E1; E2	
M4	I can deliver seminars and workshops with 90 %–100 % return			E1; E2; E3
M5	I fail to involve the whole group in seminars and workshops	E3	E1; E2	
M6	In workshops, an individual approach to each student is limited		E1; E3	E2

Table 4: The results of the expert survey about doctoral students' online classes during Covid-19

No	Statements about doctoral students' online classes	Disagree	Partially agree	Agree
D1	I can deliver lectures online with 90 %–100 % return			E1
D2	Web coverage problems prevent me from a successful delivery of online lectures		E1	
D3	When delivering lectures online I observe that students connect but do not actually participate (engage themselves in side issues)	E1		
D4	I can deliver seminars and workshops with 90 %–100 % return			E1
D5	I fail to involve the whole group in seminars and workshops	E1		
D6	In workshops, an individual approach to each student is limited	E1		

According to the results presented in expert survey table 4, only one expert has delivered doctoral courses remotely but the other two experts do not have such work experience. The sole expert agrees with statement D1 and statement D4. It brings to a conclusion that the lecturer can deliver doctoral lectures, seminars, and workshops remotely with 90 %–100 % return. Whereas, the sole expert does not agree with statements D3, D5, and D6. It follows that students both technically connect to remote doctoral lectures, seminars, and workshops as well as engage in communication with the lecturer during the lesson. In addition, it can be concluded that in remote workshops, the lecturer can implement an individual approach to each doctoral student. The sole expert

agrees with statement D2 partially thus recognizing that successful lecturing online is partially hampered by the Internet coverage problems.

The advantages of lecturer's work in an e-study environment during Covid-19 defined by experts are summarized in table 5. It shows that all experts mention the saving of time on the way to and from the higher education institution as the first advantage of the lecturer's work in the e-study environment. In turn, when defining the second advantage, the opinions of experts differ. The second advantage of work in the e-study environment mentioned by the first expert is as follows: the software provides automatic registration of the lesson participants and a detailed report hereof. The second advantage named by the second expert is the cost savings associated with travel, accommodation, eating out of the house, gifts for the family, and the purchase of new costumes necessary for lecture delivering. The third expert says that the second advantage is the software-provided opportunities for using various digital tools to work with students. The opinions of experts also differ regarding the third advantage of the lecturer's work in the e-study environment. The first expert considers that the third advantage is the savings on the lecturer's clothes, shoes, and accessories when working in the e-study environment. The second expert defines that the third advantage lays in the fact that the software allows students to record and listen to online lessons at a time which is the most convenient to them. The third advantage named by the third expert is as follows: the software allows students to use online tests in test works and get an instant test result.

Table 5: The advantages of lecturer's work in the e-study environment during Covid-19 defined by experts in priority order

No	The adventages defined by the expert No 1	The adventages defined by the expert No 2	The adventages defined by the expert No 3
1st	The saving of time on the way to and from the HEE.	The saving of time on the way to and from the HEE.	The saving of time on the way to and from the HEE.
2nd	The software provides automatic registration of the lesson participants and a detailed report hereof.	The cost savings associated with travel, accommodation, eating out of the house, gifts for the family, and the purchase of new costumes necessary for lecture delivering.	The software-provided opportunities for using various digital tools to work with students.
3rd	The savings on the lecturer’s clothes, shoes, and accessories when working in the e-study environment.	The software allows students to record and listen to online lessons at a time which is the most convenient to them.	The software allows students to use online tests in test works and get an instant test result.

The disadvantages of lecturer's work in an e-study environment during Covid-19 defined by experts are summarized in table 6. According to the first expert, the first disadvantage of the lecturer's work in the e-study environment is the insufficient technical support for the lecturer's work in the e-study environment in the home environment because of lack of a specific device or incompatibility of devices. In turn, the second and third experts point out that the first disadvantage is as follows: in the e-study environment, it is much more challenging to involve students in discussions, to observe the reaction and feedback of students, to draw conclusions about whether the content of the lesson has been mastered. In particular, there is a lack of direct communication in the e-study environment, which helps to open students up for cooperation. Whereas, as the second disadvantage of the lecturer's work in the e-study environment, the first expert names the lack of sufficiently stable web coverage for work in the e-study environment. This problem becomes extremely acute where several residents of the house have to work or study from home at the same time. Speaking of the second disadvantage of the lecturer's work in the e-study environment, the second expert refers to the fact that during the computer presentation it is technically complicated or even impossible to use other documents in other formats or voluminous materials. The third expert says that the second disadvantage of the lecturer's work in the e-study environment is the difficulty to maintain the attention of all students while one student gives his or her answer or expresses his or her opinion. The first expert continues the analysis of the flaws of the lecturer's work in the e-study environment and names the lack of sufficiently stable provision of premises for the lecturer's work in the e-study environment from home as the third disadvantage. This problem becomes extremely acute where several residents of the house have to work or study from home at the same time. The second expert mentions that the third disadvantage of the lecturer's work in the e-study environment is as follows: during the lessons

the lecturer cannot move, shift, and brighten up essential thoughts with the help of gestures, mimicry, and other movements. Namely, the lecturer can basically use only the voice, which reduces the overall impression and the lessons become less effective. In turn, the third expert defines that the third disadvantage of teaching in the e-study environment is the difficulty to make students to have their cameras on throughout the lesson.

Table 6: The disadvantages of lecturer's work in the e-study environment during Covid-19 defined by experts in priority order

No	The disadvantages defined by the expert No 1	The disadvantages defined by the expert No 2	The disadvantages defined by the expert No 3
1st	The insufficient technical support for the lecturer's work in the e-study environment in the home environment because of lack of a specific device or incompatibility of devices.	In the e-study environment, it is much more challenging to involve students in discussions, to observe the reaction and feedback of students, to draw conclusions about whether the content of the lesson has been mastered.	In the e-study environment, it is much more challenging to involve students in discussions, to observe the reaction and feedback of students, to draw conclusions about whether the content of the lesson has been mastered. In particular, there is a lack of direct communication in the e-study environment, which helps to open students up for cooperation.
2nd	The lack of sufficiently stable web coverage for work in the e-study environment. This problem becomes extremely acute where several residents of the house have to work or study from home at the same time.	The fact that during the computer presentation it is technically complicated or even impossible to use other documents in other formats or voluminous materials.	The difficulty to maintain the attention of all students while one student gives his or her answer or expresses his or her opinion.
3rd	The lack of sufficiently stable provision of premises for the lecturer's work in the e-study environment from home. This problem becomes extremely acute where several residents of the house have to work or study from home at the same time.	During the lessons the lecturer cannot move, shift, and brighten up essential thoughts with the help of gestures, mimicry, and other movements. Namely, the lecturer can basically use only the voice, which reduces the overall impression and the lessons become less effective.	The difficulty to make students to have their cameras on throughout the lesson.

5. Conclusions

Summary of experts' statements provided in all the three tables leads to the following conclusions: (1) the higher the study level, the higher the return of seminars and workshops delivered by the lecturers in the online environment; (2) the higher the study level, the better lecturers can engage students in mutual communication during lectures, seminars, and workshops delivered in the online environment; (3) the higher the study level, the better lecturers can ensure an individual approach to every student in workshops delivered in the online environment; and, (4) the higher the study level, the less lecturers are disrupted during online lectures by the Internet coverage problems.

Summary of the results of expert surveys on the lecturer's work in the e-study environment during Covid-19 brings to several conclusions: (1) lecturers in higher education institutions can implement studies in the e-study environment without experiencing significant problems; (2) the main advantages of the lecturer's work in the e-study environment are time and cost savings related to the moving to and from the higher education institution as well as the software-provided opportunity to register the lesson participants, check tests online and record online lessons; (3) the main disadvantages of the lecturer's work in the e-study environment are the insufficient technical provision and availability of premises, unstable web coverage while working from home as well as the difficulties to provide a stable communication with students and effective, diverse course of lessons.

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